Universidad Popular del Cesar

# Minería de Datos y Patrones

Version 2024-I

## Carácterísticas de Intensidad

[ Capítulo 2 ]

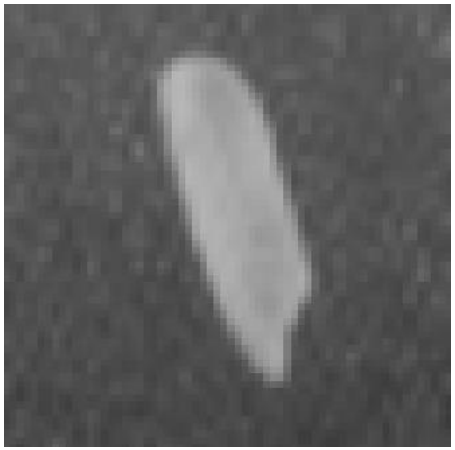

Dr. José Ramón Iglesias

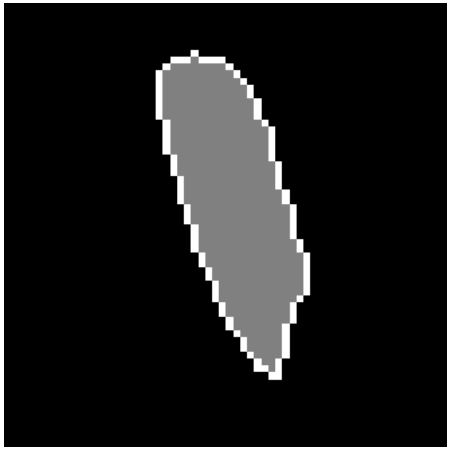
DSP-ASIC BUILDER GROUP

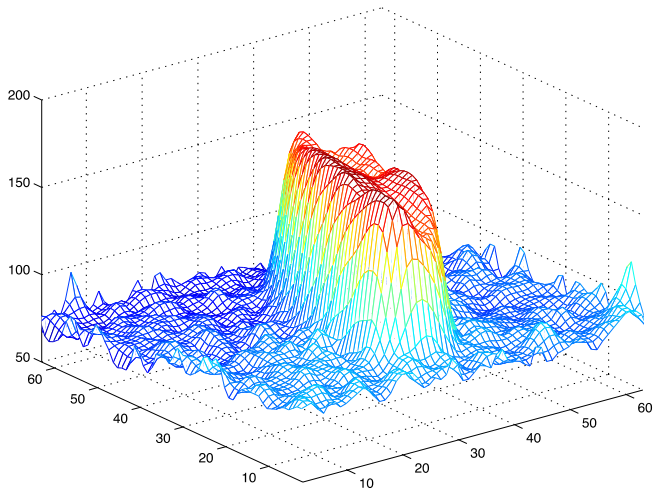
Director Semillero TRIAC

Ingenieria Electronica

Universidad Popular del Cesar







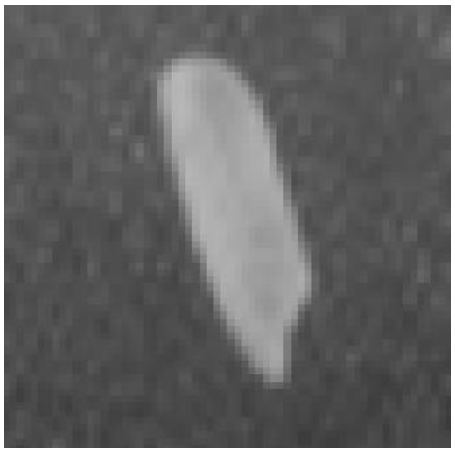

a) Grayscale image b) Segmentation c) 3D representation of a)

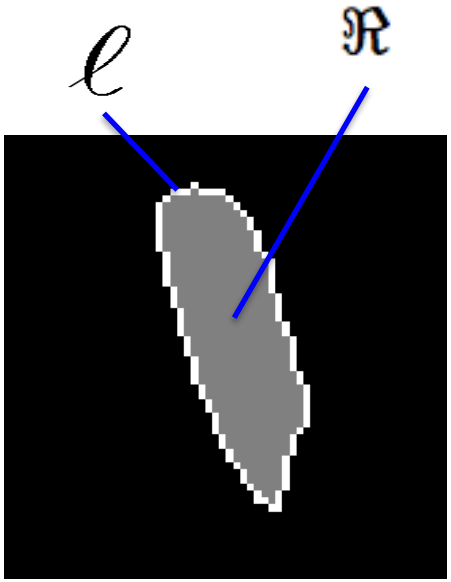
There are two categories of features: Geometric Features and Intensity Features

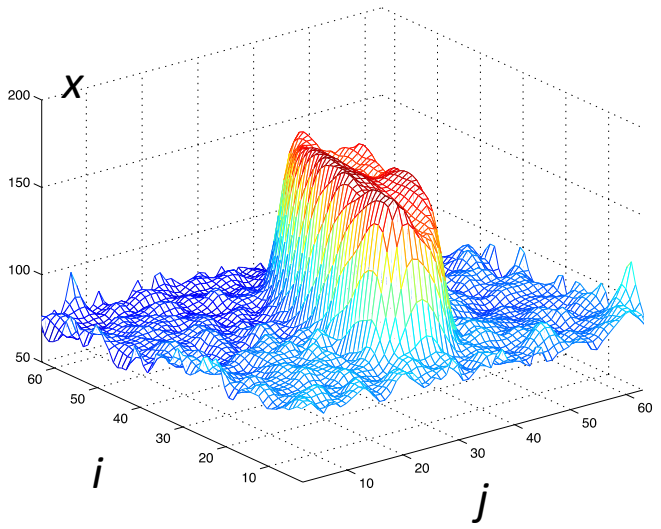
Geometric Features give information about location, orientation, shape and size.

Intensity Features give information about how are the grayvalues.

# Intensity Features




Average

$$G = \frac{1}{A} \sum_{i,j \in \Re} x[i,j]$$

Mean gradient

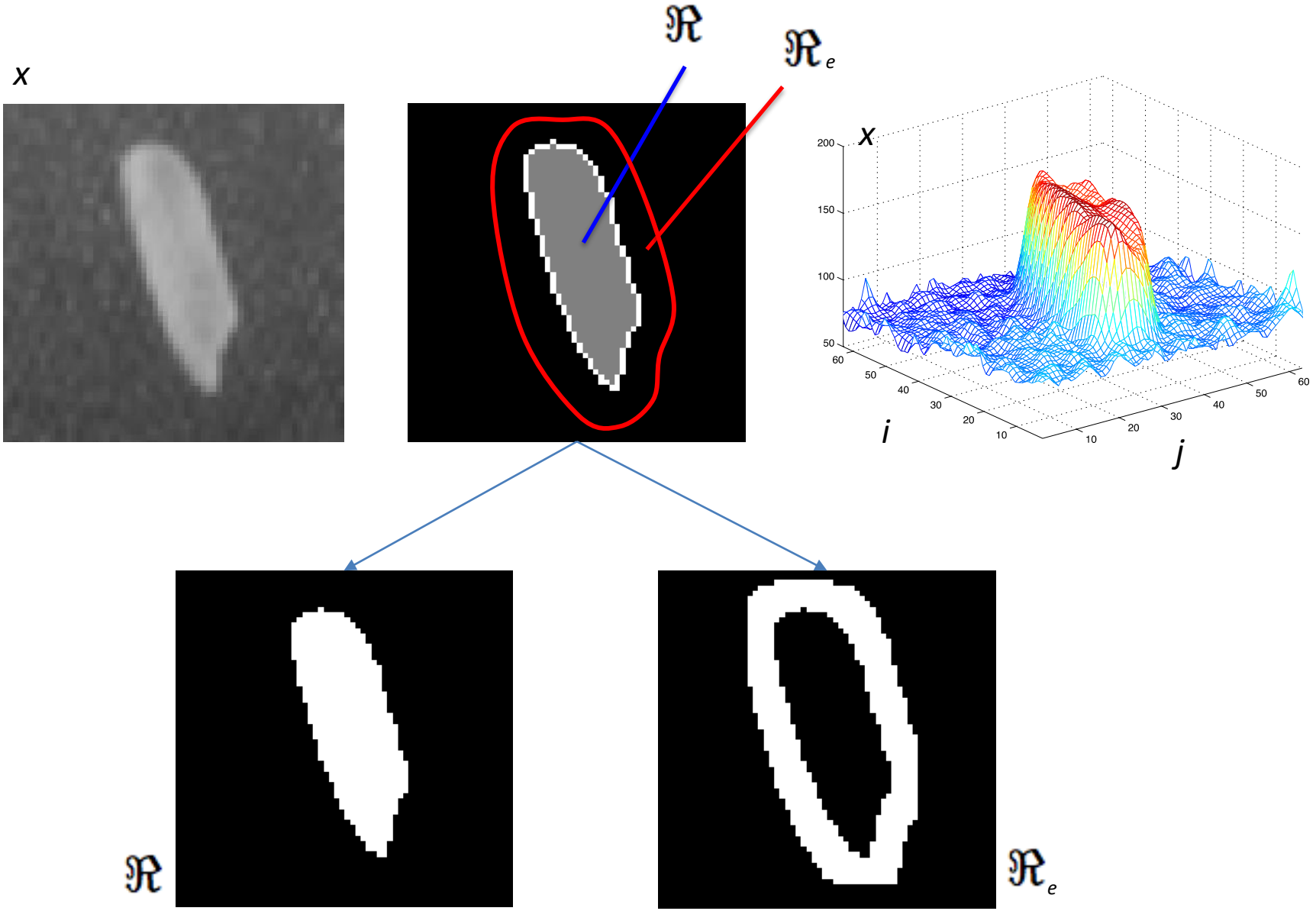
$$C = \frac{1}{L} \sum_{i,j \in \ell} x'[i,j]$$

Mean 2nd gradient

$$D = \frac{1}{A} \sum_{i,j \in \Re} x''[i,j]$$

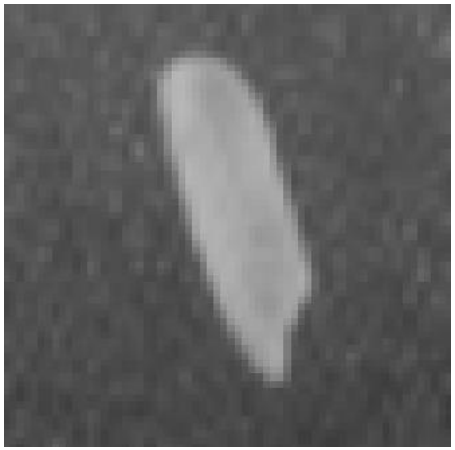
Standard deviation, etc.

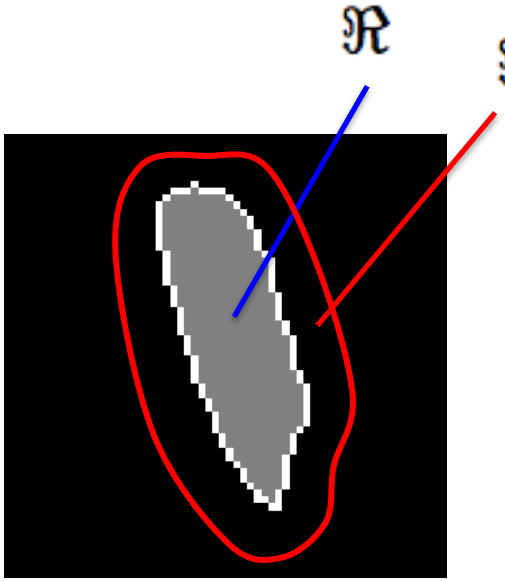
# Contrast Features

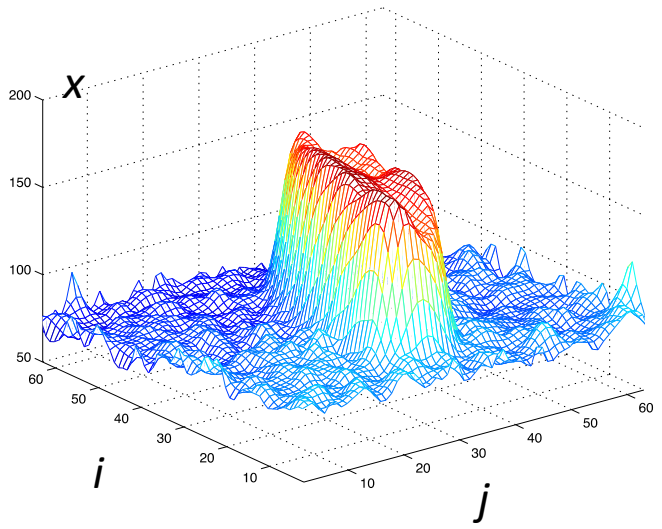


# Contrast Features

$x$





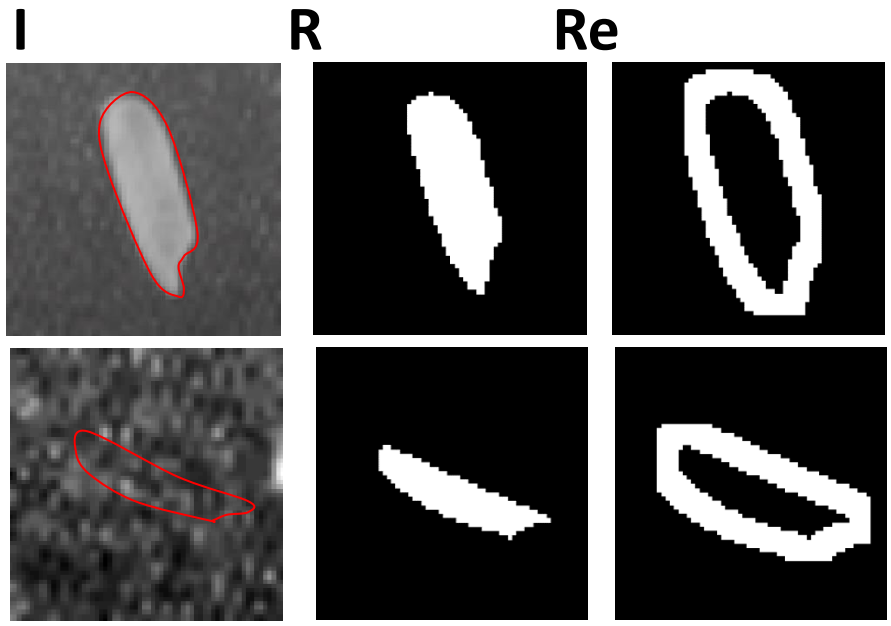

## Contrast

$$G = \frac{1}{A} \sum_{i,j \in \Re} x[i,j] \qquad G_e = \frac{1}{A_e} \sum_{i,j \in \Re_e} x[i,j]$$

$$K_1 = \frac{G - G_e}{G_e} \qquad K_2 = \frac{G - G_e}{G + G_e} \qquad K_3 = \ln(G/G_e)$$

# Contrast Features

```
I = imread('onerice.bmp');
R = I>120;
J = imdilate(R,ones(11,11));
Re = and(not(R),J);
i  = find(R==1);
ie = find(Re==1);
G = mean(I(i));
Ge = mean(I(ie));
```




```
K1 = abs(G-Ge)/Ge        %  0.85
K2 = abs(G-Ge)/(G+Ge)    %  0.30
K3 = log(G/Ge)           %  0.62
```